

OF

# MACHINES

➤ AND ➤

# BEASTS

What motorcycles,  
Greek philosophy  
and horses can teach  
us about running.

By DAVID ALM

Illustrations by CHARLIE LAYTON











**TWO WEEKS BEFORE THE 2012 NEW YORK CITY MARATHON,** I decided to test my fitness at a small 5K in Queens. I was in my late 30s, and my training had been solid. Based on the previous year's times, I thought I might be able to win. Or not. ➔ As I warmed up near the course, I saw two guys doing strides with the form of college track stars. They must have been 15 to 20 years younger than me, and they looked serious. ➔ I decided to let them go and hope they'd blow up, then attack.



At the gun, they took off at a sub-5:00 pace, even faster than I'd expected. I locked in at 5:20, my 5K sweet spot when the machine is in working order.

The strategy worked. Within minutes they were losing steam, and I was gaining ground. About a mile into the race, I passed the slower of the two and fixed my sights on the one up front. I gradually reeled him in, and when I passed him at the halfway point, he let out the slightest groan: a split-second sound of defeat.

That's your cue, I thought. Just keep your foot on the gas.

Suddenly I was no longer the pursuer; I was the prey. For the next 8 minutes, I ran scared, as if he were right behind me, a mountain lion preparing to pounce. In the end, I won by more than 30 seconds.

Later that day, a friend sent me a one-word text message: "BEAST!"

It's one of the most common metaphors in running and among the sport's highest words of praise—second only to "machine." Both connote immense power and strength, an ability to run harder, faster and with more determination than we might have thought possible.

But they couldn't be more different. A machine is tireless and precise, able to crank out a specific result consistently; a beast represents formidable, brute force, the incarnation of pure will. And we know we are neither. We are weak and unpredictable, prone to injury and self-doubt.

And yet, those metaphors serve a purpose no less important than our stopwatches and racing flats. Thinking of ourselves as machines helps us to tick off the miles during the long, lonely stretches of a race, while imagining that we're beasts enables us to dig deep and, on a good day, to devour our competition.

Together, the machine and the beast comprise the two sides of a competitive runner's psyche—scientific reason and primal instinct—and negotiating between those two is essential to being the best runners we can be.

**I SAW MYSELF IN HIS PAINED,  
BURST OF SPEED THAT SEEMED**



## THE RUNNER AS MACHINE

The machine is our foundation, our ability to run the same pace for hours at a time and to log 70-, 80-, 90-plus miles per week. The beast emerges later, in the grueling throes of competition, after the machine has done all it can. And our language reflects this: We reserve the beast metaphor for post-race congratulations, but machine metaphors permeate the discourse of running.

We don't just get faster, we "develop new gears." We don't just have legs, we have "wheels." We go on "cruise control" on flat roads and "power up" difficult hills. My father, who ran in the '80s, once told a fast woman he knew that she was "like a steel spring wrapped in skin."

Even when things go badly, the metaphors persist: We "run out of gas," "lose steam," "fall apart" and "blow up." Deep down, we realize that while we aspire to machine-like precision, machines too can fail—the admission is built into our vocabulary. But in theory, the best machines, those tended to and cared for the most, fail the least.

In this sense, I've come to see us more like mechanics than machines. And though we're not likely to hear "You're a mechanic!" being shouted from the sidelines of a race anytime soon, it's a far more compelling metaphor. It encompasses not just the race, but everything we do to get there—the tempo runs, ice baths, speed intervals and massages. After all, a machine is only as good as its upkeep.

In his 2009 book about the moral value of manual trades, *Shop Class as Soulcraft*, the philosopher-mechanic Matthew Crawford writes that his job is to keep a motorcycle functioning at optimum efficiency no matter how old it might be, to be conscientious and invested enough in his work to intuit mechanical problems not immediately apparent, and to develop the kind of knowledge that comes only with years of experience.

Crawford's book resonated with me as a runner. Training our bodies to run, and to keep running, is like working on old bikes: We care for them, mend them when they're broken and test them constantly. And we listen to them, ever vigilant against signs of disrepair. A runner's twinge is a motorcycle's loose nut—get to it early and make sure the machine can keep doing its job.

What motivates this endless devotion to our own maintenance?

A common view is control. What we lack in life, we seek in sport—mastery over the entire enterprise. We constantly revise our training to improve our PRs, alter our diets to achieve maximum strength at minimal weight, create schedules, log every mile and generally plan our lives around running. We tinker, tweak, adjust and reset. And come race day, if everything goes according to plan, we get to perform like machines—tireless, precise and consistent.

But as Robert Pirsig writes in his 1974 classic, *Zen*



and the *Art of Motorcycle Maintenance*, "You are never dedicated to something you have complete confidence in." Like the mechanic, we ply our trade on something we neither designed nor built, and troubleshooting is the name of the game. We routinely subject ourselves to chance, to the whims of flesh and bone and to training methods that revolve not around foolproof absolutes, but variables and probabilities.

Aristotle would say that we are practitioners of a stochastic art: The word translates as "to guess at" or "to aim"—if

**DETERMINED FACE; HIS POWERFUL, RESOLUTE STRIDE; AND HIS FINAL  
TO COMMUNICATE ONE SIMPLE THOUGHT: TO HELL WITH THIS—LET'S GO.**



## TUNE THE MACHINE

Runners earn the title "machine" by being reliable and efficient. To hone your machine-like qualities:

- » Keep your training consistent all year long; train smart as well as hard.
- » Perfect your pacing in training and racing. Treadmills can be great conditioning tools.
- » Smooth your form to become more efficient and to reduce chances of injury.
- » Listen to your engine and take action at every signal, be it dehydration or a hamstring niggle.
- » Race regularly to become familiar with all race-day variables and expert at handling them with poise.
- » Maintain your upkeep with proper fuel, strength training and massages.

## FEED THE BEAST

Some runners are more naturally beasts than others, but all of us can embrace our animal instinct. Here's how:

- » Do explosive workouts, like all-out hill sprints or 400m repeats, which force you to let go and recruit all of your muscle fibers and neural pathways.
- » Reframe effort as something to embrace and relish, not a burden to endure.
- » Do fartleks. Remove the usual pacing and steady-effort governors and react instinctively to the terrain and to how you feel at the moment.
- » Run trails or go completely off-trail and blaze over hills, into canyons and through forests.
- » Leave the gadgets (Garmin, iPed) at home, and if you run with a partner, commit to doing some runs in total silence.

you do this, then you should be able to achieve that. But you might not. In any stochastic art, Crawford notes, mastery is compatible with failure.

"Fixing things, whether cars or human bodies, is very different from building things from scratch," he writes. "The mechanic and the doctor deal with failure every day, even if they are expert. ... This is because they fix things that are not of their making, and are therefore never known in a comprehensive or absolute way."

For runners, such uncertainty manifests itself as a buzzing, full-body kind of excitement every time we toe the line. Why else would we keep doing it? If we got what we wanted every time we tried, we'd lose interest. Our blowups are just as motivating as our PRs, and we never know which one is going to happen. You can have a flawless cycle, and the wheels can always come off.

I've run more than 100 races, including 21 marathons, and if I've learned one thing, it's that preparing for a race—being a mechanic—takes you only so far. You still have to run the race. And, while training is rational—meticulous, deliberate and logical—racing is insane. As the body begins to exhaust its glycogen reserves, the brain greedily tries to siphon up whatever is left, depriving our muscles of the fuel they need to keep going—hence the defeatist self-talk in the latter stages of a race, those seemingly sensible decisions you find yourself making to just

stop and walk or settle for a slower time. "Hey, this is stupid," your mind whispers. "Give yourself a break."

It's often said that overcoming that self-talk—especially during the final miles of a marathon—is entirely mental. But that implies higher-order cognition, an ability to reason your way through a race as if it were a game of chess—a battle of wits with your opposition and your own failing body. It implies rational thought, and as any competitive runner knows, your thoughts at the end of a race are anything but rational.

On the contrary, racing taps into something far more instinctual and automatic—our lizard brain, if you will. It's a carryover from when we crawled out of the primordial swamp, caring about just one thing: survival. We may have evolved into intelligent beings, but the lizard brain is still there, at the back of our skull just above our spine, telling us when to attack and when to run.

## THE RUNNER AS BEAST

Last spring I met a group of friends to watch the Kentucky Derby at a bar in Brooklyn. The room was full of men wearing seersucker suits and women in summer dresses and floppy, wide-brimmed hats. As my friends talked about the trainers and jockeys, I was enthralled with the horses.

Halfway into the race, a horse named Orb began moving up the pack, from 15<sup>th</sup> place to first by the final stretch, where he broke into an all-out sprint. His jockey stopped spurring him on and just let him fly. It was as if Orb knew the finish line was straight ahead and was determined to be the first one to get there. As he shot across that line, the crowd cheered, toasted their mint juleps and resumed their conversations. But I couldn't stop thinking about the horse.

Surrounded by the pretenses of civilization, I felt a profound sense of kinship with a soaking-wet colt galloping through the mud. I saw myself in his pained, determined face; his powerful, resolute stride; and his final burst of speed that seemed to communicate one simple thought: To hell with this—let's go.

Kenneth McKeever, a professor of equine exercise physiology at Rutgers University, says the kinship is real—from the cellular level to competitive psychology. "Horses are just like humans," he says. They sweat profusely, their plasma expands when they run, and they're natural athletes.

If we're looking for a model of the ultimate beast, however, mechanically speaking, horses are not the greatest distance runners in the animal kingdom. That distinction, says Bernd Heinrich, biologist and 2:25 marathoner, goes to the pronghorn antelope, which has roamed the Great Plains of North America for more than 4 million years, staying alive by outrunning predators like lions,

I HAD TUNED THE CRUISE  
BUT IN THE FINAL MINUTES





## LESSONS

FROM THE METAPHORS

1

Approach running as a project, and accept uncertainties and failure as necessary parts of the process.

2

Know that a well-tuned body is only part of the equation; train the beast as well as the machine.

3

Remember that your mind will play tricks on you; you can override its fatigue signals by tapping into your survival instincts.

4

At the end of a race, forget pacing and let yourself go.

saber-toothed tigers and even cheetahs. Pronghorns can run up to 61 miles per hour. have been known to cover 7 miles in just 10 minutes, and have a  $VO_2$  max of 300 milliliters of oxygen per kilogram of body weight. For comparison, a thoroughbred racehorse has a  $VO_2$  max of about 180, and Kilian Jornet registers 89.5—several points higher than most elite marathoners.

But pronghorns aren't domesticated; they run only for survival. Horses, meanwhile, submit to training methods like ours: They do speed intervals, hill repeats and tempo runs. "Horses readily exercise, they love it, and they give it their all," McKeever says.

Still, no amount of training can account for that elusive quality that gives an athlete like Orb his edge. "With some horses, you can just see it's in their heads—they're going to win," McKeever says.

Many of the best human runners have the same edge. "I'm going to work so that it's a pure-guts race at the end," Pre once said. "And if it is, I'm the only one who can win it."

But what does it mean to run a pure-guts race? David Epstein, whose book *The Sports Gene* explores myriad factors that contribute to athletic excellence, says that even the greatest endurance runners are never close to running all-out. "Even at the end of a marathon, there is a massive proportion of muscle fibers left unrecruited by the brain," he says. Recruiting those fibers requires overriding the brain's fatigue signals. Animals in the wild do this frequently, because their lives depend on it. We do it under dire circumstances, or, in the case of sports, contrived ones.

Seeing a finish line, for example, provides "a situational context" that "engages some of that hardware that evolved for survival," Epstein says, thus enabling us to push harder than we thought we could midrace. "When the end is near, the brain-rationing is lifted to a degree."

No race in recent memory has exemplified this more than the 2005 New York City Marathon, where defending champion Hendrick Ramaala and Paul Tergat sprinted neck and neck for the final 385 yards of that race. As Tergat ground his teeth and hurtled himself forward with his long, relentless strides, Ramaala fought back hard, his eyes wide, his mouth agape. In the final seconds of the race, Tergat surged and Ramaala fell back by a single step. Ramaala would later say that he felt nothing but resistance in his legs and that he simply "ran out of gears." He collapsed the moment he crossed the finish line.

"We can't really know whether Tergat was slightly more fit or economical than Ramaala, or whether he was slightly

tougher," Epstein says. But, "When [two runners] are battling it out to the finish, whichever one can better override their brain's fatigue signals and recruit just a bit more muscle for the job is going to win."

We'll never know if Orb was better conditioned than his competition that day or if he was able to dig just a little deeper. But as those 15 horses circled that 1-mile track, each of them morphed, one by one, from the machines they'd been trained to be into the beasts they are.

## THE RUNNER AS HUMAN

After that race in Queens, the guy who finished second told me he had indeed just graduated from college, where he ran 1:51 in the 800m—a speed I'll never reach no matter how hard I train. He had the gears, but he didn't yet know how to use them in a longer race. I was 37, I had tuned the cruise control over countless miles, and I knew exactly how to pace myself for a 5K. But my internal GPS only took me so far. In the final minutes of that race, I became nothing but heat, breath, a pounding heartbeat and two increasingly heavy legs churning the earth beneath my feet.

And though I raced like Orb that day, I'm usually one of the horses trailing behind—giving it everything but, like Ramaala, running out of gears. At the same race a year later, I pushed just as hard and finished eighth, more than 1 minute behind the guy I'd beaten in 2012. Because no matter how much we might want something—an overall win, a negative split, a PR—our mechanical limitations cannot always be overcome by will alone. Orb isn't undefeated and neither was Pre.

But that's beside the point—or rather, it's the whole point. "The experience of failure tempers the conceit of mastery," Crawford writes, and it motivates us to keep at it. In the negotiation between our internal machines and beasts, placement, time and prizes are irrelevant. And the ultimate goal is not machine-like perfection, but something far more attainable: the knowledge that we invested ourselves completely in the project, developed the best machines we could and, when the time came, let the beasts in us take charge and carry us along with determination and force we didn't know we had.

After all, we may be weak and unpredictable, prone to injury and self-doubt, but that's not all we are. In running, we find a rare opportunity to be driven as much by reason and the desire for excellence as by basic, animal instinct. That is, human. *nr*

**CONTROL OVER COUNTLESS MILES, I KNEW EXACTLY HOW TO PACE MYSELF; I BECAME NOTHING BUT HEAT, BREATH AND A POUNDING HEARTBEAT.**